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**Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/468,489 12/20/99 ZHANG

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EXAMINER

MMC2/1009

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ART UNIT

PAPER NUMBER

2814

DATE MAILED:

10/09/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

09/468,489

Applicant(s)

ZHANG, HONGYONG

Examiner

Tuan Quach

Art Unit

2814

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 7-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### DETAILED ACTION

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hodate et al. taken with Yudasaka et al.

Hodate et al. show implant to form lightly doped region 55 and further implant to form heavily doped region 57. The gate insulating layer 45 and the gate electrode 46 is also shown. See column 12 lines 9-56. Hodate et al. lack anticipation in that it does not show the patterned island shaped semiconductor layers and do not recite the hydrogen ions.

It would have been to one skilled in the art in practicing the Hodate et al. invention to have employed the various island patterned semiconductors since such corresponds to conventional patterns as shown in Yudasaka et al., Fig. 4 wherein such would permit the formation of adjacent transistors as shown in Fig. 4 and the corresponding description. The alternative of implant through thin gate insulating layer (corresponding to 50 nm or less) or directly would have been an obvious alternative as shown in Fig.8A of Hodate et al. and as such would have been obvious. It would have been obvious to have included hydrogen ions in the implant wherein the implanted ions would permit formation of low concentration which can be activated even at a low temperature thereby permitting such LDD TFT structures on glass substrate and

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permitting the use of low electrical resistance as delineated in Hudasaka et al., column 38 lines 1-16, column 5 line 10-25, column 18 lines 50 to column 19 line 18, column 24 lines 29 to column 25 line 12, column 27 lines 50 to column 28 line 7, column 29 lines 7-39. Note that the hydrogen is not required to be implanted to the channel region which is masked by the gate thereon and the hydrogen as shown to have incorporated only into implanted regions which correspond to the source/drain or low concentration regions. It would have been within the purview of one skilled in the art to have selected the conventional implant apparatus as in claim 2, the desired energy as shown in claim 3 given the closely approximate energy in Hodate et al. depending on the projected range desired. The use of hydride as ion source is well known in the art, e.g., Yudasaka et al., column 29 line 18 et seq. and as such would have been obvious.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hodate et al. taken with Yudasaka et al. as applied to claims 1-4 above, and further in view of Yamazaki et al.

The references as applied as above do not recite the laser annealing in these claims.

Yamazaki et al. teach the use of laser annealing for recrystallization, see e.g., column 5 lines 60-64 and for activation, see column 6 lines 24-36.

It would have been obvious to one skilled in the art in practicing the above process to have employed laser annealing to recrystallize and to activate dopants since such corresponds to conventional techniques for such purposes as shown in Yamazaki et al. The damage would be recovered during such activation or alternatively, it would

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have been obvious to one skilled in the art to have obtained recovery of the damage during such annealing.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hodate et al. taken with Yudasaka et al. and Yamazaki et al.

Hodate, Yudasak et al., and Yamazaki et al. are applied as above. It would have been obvious to have employed the island patterned semiconductors for the reasons delineated above and to have employed laser annealing for the reasons delineated above with regard to claim 1 and claims 5-6, respectively.

Applicant's arguments filed July 5, 2001 have been fully considered but they are not persuasive.

See the reasons delineated above regarding the hydrogen implant and as shown in the corresponding description in Yudasaka et al. which do not require the hydrogen implant in the channel region and which is further masked from such implant by the presence of the gate thereon.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Quach whose telephone number is 703-308-1096. The examiner can normally be reached on M-F from 9 to 5. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

  
Tuan Quach  
Primary Examiner